

CNZ1102,CNZ1108

Photo Interrupters

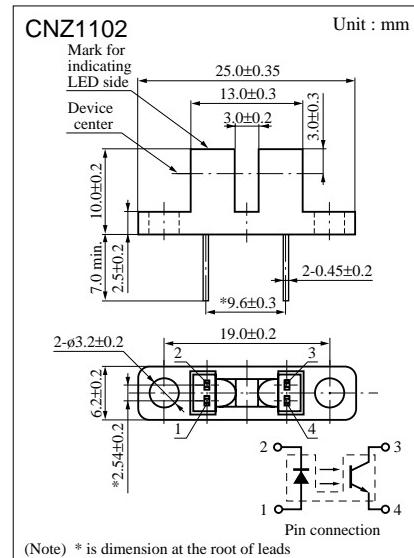
For contactless SW, object detection

■ Overview

CNZ1102 and CNZ1108 are a photocoupler in which a high efficiency GaAs infrared light emitting diode is used as the light emitting element, and a high sensitivity phototransistor is used as the light detecting element. The two elements are arranged so as to face each other, and objects passing between them are detected.

■ Features

- Position detection accuracy : 1.2 mm
 - Large output current
 - Fast response : $t_r, t_f = 4 \mu\text{s}$ (typ.) (CNZ1102)
 $6 \mu\text{s}$ (typ.) (CNZ1108)
 - Small output current variation against change in temperature
 - Small package used for saving mounting space (CNZ1108)

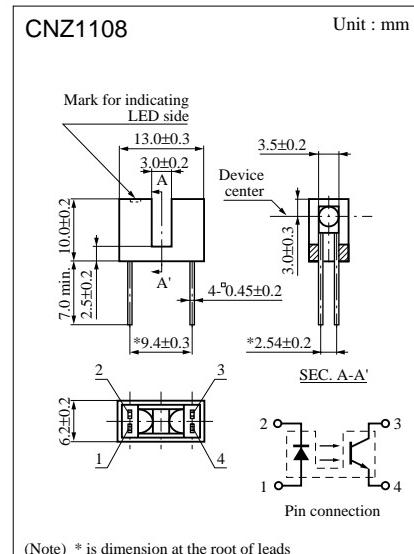


Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Parameter		Symbol	Ratings	Unit
Input (Light emitting diode)	Reverse voltage (DC)	V _R	3	V
	Forward current (DC)	I _F	50	mA
	Power dissipation	P _D ^{*1}	75	mW
Output (Phototransistor)	Collector current	I _C	20	mA
	Collector to emitter voltage	V _{CEO}	30	V
	Emitter to collector voltage	V _{ECO}	5	V
	Collector power dissipation	P _C ^{*2}	100	mW
Temperature	Operating ambient temperature	T _{opr}	-25 to +85	°C
	Storage temperature	T _{stg}	-30 to +100	°C

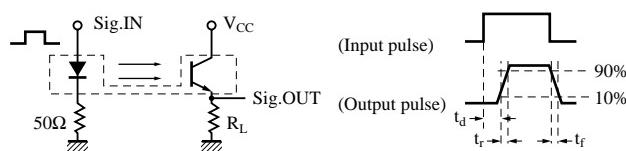
^{*1} Input power derating ratio is 1.0 mW/°C at Ta ≥ 25°C.

^{*2} Output power derating ratio is 1.33 mW/°C at Ta ≥ 25°C.



■ Electrical Characteristics ($T_a = 25^\circ\text{C}$)

Parameter		Symbol	Conditions	min	typ	max	Unit
Input characteristics	Forward voltage (DC)	V_F	$I_F = 50\text{mA}$		1.2	1.5	V
	Reverse current (DC)	I_R	$V_R = 3\text{V}$			10	μA
	Capacitance between terminals	C_t	$V_R = 0\text{V}, f = 1\text{MHz}$		50		pF
Output characteristics	Collector cutoff current	I_{CEO}	$V_{CE} = 10\text{V}$			200	nA
	Collector to emitter capacitance	C_C	$V_{CE} = 10\text{V}, f = 1\text{MHz}$		5		pF
Collector current		I_C^{*2}	$V_{CE} = 10\text{V}, I_F = 20\text{mA}$	2			mA
Transfer characteristics	Response time	CNZ1102	$V_{CC} = 10\text{V}, I_C = 5\text{mA}, R_L = 100\Omega$		4		μs
		CNZ1108	$V_{CC} = 10\text{V}, I_C = 1\text{mA}, R_L = 100\Omega$		6		μs
	Collector to emitter	CNZ1102	$V_{CE(\text{sat})}$	$I_F = 50\text{mA}, I_C = 1\text{mA}$		0.4	V
	Saturation voltage	CNZ1108	$V_{CE(\text{sat})}$	$I_F = 50\text{mA}, I_C = 0.1\text{mA}$		0.4	V

^{*1} Switching time measurement circuit t_d : Delay time t_r : Rise time (Time required for the collector current to increase from 10% to 90% of its final value) t_f : Fall time (Time required for the collector current to decrease from 90% to 10% of its initial value)^{*2} I_C classifications

Class	Q	R	S
I_C (mA)	2.0 to 5.0	4.0 to 10.0	7.0 to 20.0

